MINERAL BLOCK SUMMARY

PART A- GENERAL INFORMATION ABOUT MINERAL BLOCK

Sl. No.	Features	Details
1	Name of the Block	Mahulsukha Iron & Manganese Ore Block
	Location	Details of block boundary DGPS delineated coordinates are available in GR
	Latitude	$21^0$46'52.12" to $21^0$49'04.55" N
	Longitude	$85^0$07'55.43" to $85^0$09'10.42" E
	Villages	Randa, Rantha & Bhutuda
	Tahasil	Lahunipada
	District	Sundargarh
	State	Odisha
	Mineral Block	Manganese & Iron
Area/Hects/Sq.Kms		
2	Total block area	399.838 ha (Area as per DGPS computation=390.317 Ha)
	Mineralised area	201.978
	Non-Mineralised area	197.860
Exploration		
3	Status (G2/G3/G4)	G1-18.00 Ha& G2-381.838 Ha
	Exploration Agency	The Associated Cement Companies Limited Orewin Engineering GemcoKati Exploration Pvt. Ltd.
	Total Nos. Of bore holes with meterage	416nos with 13279.71m
	Bore hole spacing	50m x 50m / 100m x 100m
Qty. of minerals grade-wise		
4	Mineral	**Mn Ore: 771442.49 MT (all are lumpy)**

Total Geological Resources (Reserve) as on 01.04 2019

Level of Exploration	Resources of Mn Ore(Ton)	Grade	Average Grade of Ore (Mn%)
Measured(G1)	27279.27	10 to 20% Mn	14.74
	200047.96	20% Mn& Above	28.66
Indicated Resource (G2)	65293.83	10 to 20% Mn	14.74
	478821.43	20% Mn& Above	28.66
Total	**771442.49**	**10% Mn& Above**	**25.95**

Iron Ore:32814486MT

Level of Exploration	Resources of Iron Ore(Ton)		Grade	Average Grade of Ore (Fe%)
	Lumps @38.22%	Fines @ 61.78%		
Indicated Resource (G2)	8152103	13177313	45 to 55% Fe	49.88
	4389594	7095476	55% Fe & Above	58.99
Total	**12541697**	**20272789**	**45% Fe & Above**	**53.07**

Lump to Fines Ratio of Iron Ore: 38.22 : 61.78

<table>
<tr><td colspan="4">Mineralised zone</td></tr>
<tr><td></td><td>Projected Resources As on Date 31.03.2020 considering depletion (likely production as per EC limit-0.04 mt Mn ore)</td><td colspan="2">Mn Ore: 731442.5 MT (all are lumpy)

<table>
<tr><td>Level of Exploration</td><td>Resources of Mn Ore(Ton)</td><td>Grade</td><td>Average Grade of Ore (Mn%)</td></tr>
<tr><td rowspan="2">Indicated Resource (G2)</td><td>87773.10</td><td>10 to 20% Mn</td><td>14.74</td></tr>
<tr><td>643669.39</td><td>20% Mn & Above</td><td>28.66</td></tr>
<tr><td>Total</td><td>731442.49</td><td>10% Mn & Above</td><td>25.95</td></tr>
</table></td></tr>
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</table></td></tr>
<tr><td>5</td><td>Nos. Of Mineralised zones</td><td colspan="2">Iron Ore & Mn Ore: 13</td></tr>
<tr><td></td><td>Trend (Dip & Strike)</td><td colspan="2">The general trend of the planer element is WNW-ESE with either northerly or southerly dipsvarying from 20˚ to 70˚.</td></tr>
<tr><td></td><td>Average thickness</td><td colspan="2">Mn Ore zone-40m, Iron Ore zone-50m</td></tr>
<tr><td colspan="4">Grade</td></tr>
<tr><td>6</td><td>Minerals</td><td colspan="2">Mn Ore-10-20%Mn & +20%Mn
Iron Ore-45-55%Fe &55%Fe& above</td></tr>
<tr><td colspan="4">Accessibility</td></tr>
<tr><td>7</td><td>Nearest Railhead</td><td colspan="2">The nearest railhead is at Barsuan at a distance of 15 Km from the lease area.</td></tr>
<tr><td></td><td>Road</td><td colspan="2">The lease area is approachable from Barbil through 35 km long well maintained metalled road (NH - 215) uptoKoira, 8 Km. metalled road (National Highway 215 connecting Rourkela and Koira) and a fair weather road of 10 Km which is the link between NH and lease area</td></tr>
<tr><td></td><td>Airport</td><td colspan="2">Bhubaneswar airport (360 km away) was the nearest airport from the area. There is an airstrip/ helipad near Bhadrasahi, Barbil whichis around 38km from the lease area. Jharsuguda Airport started functioning in the recent past and it is about 220 km from the lease area.</td></tr>
<tr><td colspan="4">Hydrography</td></tr>
</table>

	Local surface drainage pattern (channels)	The core zone (lease area) is made up four hilly blocks dissected by the natural streams at many places with varying slope. Two perennial nalas flow from the eastern part and one perennial nala locally known as Rajabasanala flow from the SW part of the lease area. These perennial nalas merge to form the Bhutudanala which flows towards north and finally drains into Kurarhinala in the north part outside ML area. Western part in buffer zone is drained by KhandadharNala and GagarNala which flow due east. Their confluence point exists a distance of 6km from the lease area. From the confluence point, Hansaradihinala starts flowing towards further east. South-North trending dissected hill range that dominates the northern part of the buffer zone seasonal nala& starting from the hill range joins with a perennial nala flowing north parallel to the eastern lease boundary of Lohadangar block (ref : Plate-III). Finally, water flows into SarakandaNala in the North, an important tributary of the buffer zone. Through there is another perennial nala known as KhandadharNala exists at a distance of 8 km from southern lease boundary and flows due west there is no scope of drainage of southern most Nandagira hill block. The entire drainage which has a broad dendrite pattern is controlled by this tributary in the northern part.
	River/ Streams	KuradhiNala, KhandadharNala, SarkandaNala
Climate		
9	Mean Annual Rainfall	1300mm
	Temperature (Dec)	4.4^0C
	Temperature (June)	47.6^0C
Topography		
10	Toposheet Nos.	73 G/1
	Morphology of the area	The core zone (lease area) is made up four hilly blocks dissected by the natural streams at many places with the slope varying from 1 in 3 in the higher parts to 1 in 28 in the lower part giving an overall gradient of 1 in 10. The altitude in the highest part is 800m (Nandagira Hill) and in the lowest part about 460m. The overall slopes are due north. Manganese ore quarries are located along the nala sides. As per the hal settlement, 85% of the lease area is recorded as forest land. About one third of lease area has already been cleared for mining purposes which are distributed in all four blocks. At many places, no tree (forest free) land is available in the recorded forest area. Particularly, both the sides of nala course in the lease area do not have any canopy cover.

PART C- PARTICULARS OF LAND		
1	Total concession area	399.838 Ha
2	Forest land with status	377.563 Ha. The lessee has obtained forest clearance (Stage-II) over an area of 227.00Ha, an area over 120.733 Ha is under Safety Zone. Forest Clearance under Section 2(iii) of the FC Act 1980 is in force for the SZ area(120.733 Ha) and balance

<table>
<tr><td></td><td></td><td colspan="3">Forest land of 29.830 Ha.
Surface Right obtained over an area of 377.175Ha</td></tr>
<tr><td>3</td><td>Govt. Land with status</td><td colspan="3">13.145 Ha. Surface Right obtained over an area of 13.145Ha</td></tr>
<tr><td>4</td><td>Private land with status</td><td colspan="3">9.130 Ha. Surface Right obtained over an area of 9.130Ha</td></tr>
<tr><td>5</td><td>Revenue survey details of the area</td><td colspan="3"><table>
<tr><td>a)Non Forest area</td><td>Area (Ha)</td><td>Type of land</td></tr>
<tr><td>i)</td><td>7.964</td><td>Agricultural land</td></tr>
<tr><td>ii)</td><td>4.355</td><td>Village site</td></tr>
<tr><td>iii)</td><td>0.935</td><td>Road</td></tr>
<tr><td>iv)</td><td>9.021</td><td>Waste Land</td></tr>
<tr><td>Sub Total (a)</td><td>22.275</td><td></td></tr>
<tr><td>a)Forest area</td><td>Area (Ha)</td><td>Type of land</td></tr>
<tr><td>i)</td><td>223.982</td><td>PRF</td></tr>
<tr><td>ii)</td><td>1.315</td><td>K.F</td></tr>
<tr><td>iii)</td><td>152.266</td><td>DLC</td></tr>
<tr><td>Sub Total (b)</td><td>377.563</td><td></td></tr>
<tr><td>Grand Total (a + b)</td><td>399.838</td><td></td></tr>
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PART B-PARTICULARS OF STATUTORY LICENSE, PERMITS, PERMISSIONS, CONCESSIONS, APPROVALS AND CONSENTS RELATED TO MINING OPERATIONS

Sl. No.	Particulars	Details/Status
1	Forest Clearance	*To be obtained by the Successful bidder/not applicable/if available, State to provide details*
2	Wild life Clearance(Sanctuary, Reserve or Special Zone Clearances	-do-
3	Environmental Clearance	-do-
4	Consent to Establish	-do-
5	Explosive License	-do-
6	Permission for Mines opening	-do-
7	Permission of Installation, tiral operation of equipment	-do-
8	Ground water clearance (Centre/State)	-do-
9	Railway Siding approval	-do-
10	Approval of Diesel storage	-do-
11	Power line from State Discom	-do-

12	Clearanc relating to work under an existing transmission line or shifting of the transmission line	-do-
13	Gramasabha consent	-do-

PART C- PARTICULARS OF LAND		
1	Total concession area	390.317 Ha
2	Forest land with status	368.042 Ha.
3	Non-Forest , Govt. & Private Land with status	22.275 Ha
4	Revenue survey details of the area	Referred to Land Schedule